Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Environmental Assessment Division
Juneau, Alaska

Report of Field Investigations of Proposed Log Transfer Sites Suemez Island - Revillagigedo Island October 31 - November 3, 1977

INTRODUCTION

In response to a request from the planning team of the Tongass National Forest, Ketchikan Area, the Environmental Assessment Division of the National Marine Fisheries Service investigated a number of proposed sites in estuaries to determine their suitability for use as log transfer sites. Dumping logs into estuaries, where they are formed into rafts for transport to processing centers, results in massive loss of bark that settles to the bottom, smothering sessile plant and animal life and degrading habitat for motile animal life. By investigating proposed sites, the degree of harmful impacts can be determined and recommendations made as to their suitability.

Sites investigated were located on Suemez, Revillagigedo, and Hassler Islands (Figure 1). Some proposed sites had been investigated previously and are discussed in other reports. Table I summarizes timber volumes, miles of road planned, and status for each site.

OBJECTIVES

1. Investigate intertidal and subtidal habitat and associated animals and plants that would be impacted by bark accumulation introduced by log dumping.

2. Determine the extent of biological production in terms of epibenthic animals and plants.

3. Investigate possible alternative sites in order to assess relative biological productivity among the sites.

METHODS

Duane Petersen, Ron Berg, and George Perkins conducted this study, utilizing SCUBA to obtain underwater observations. A

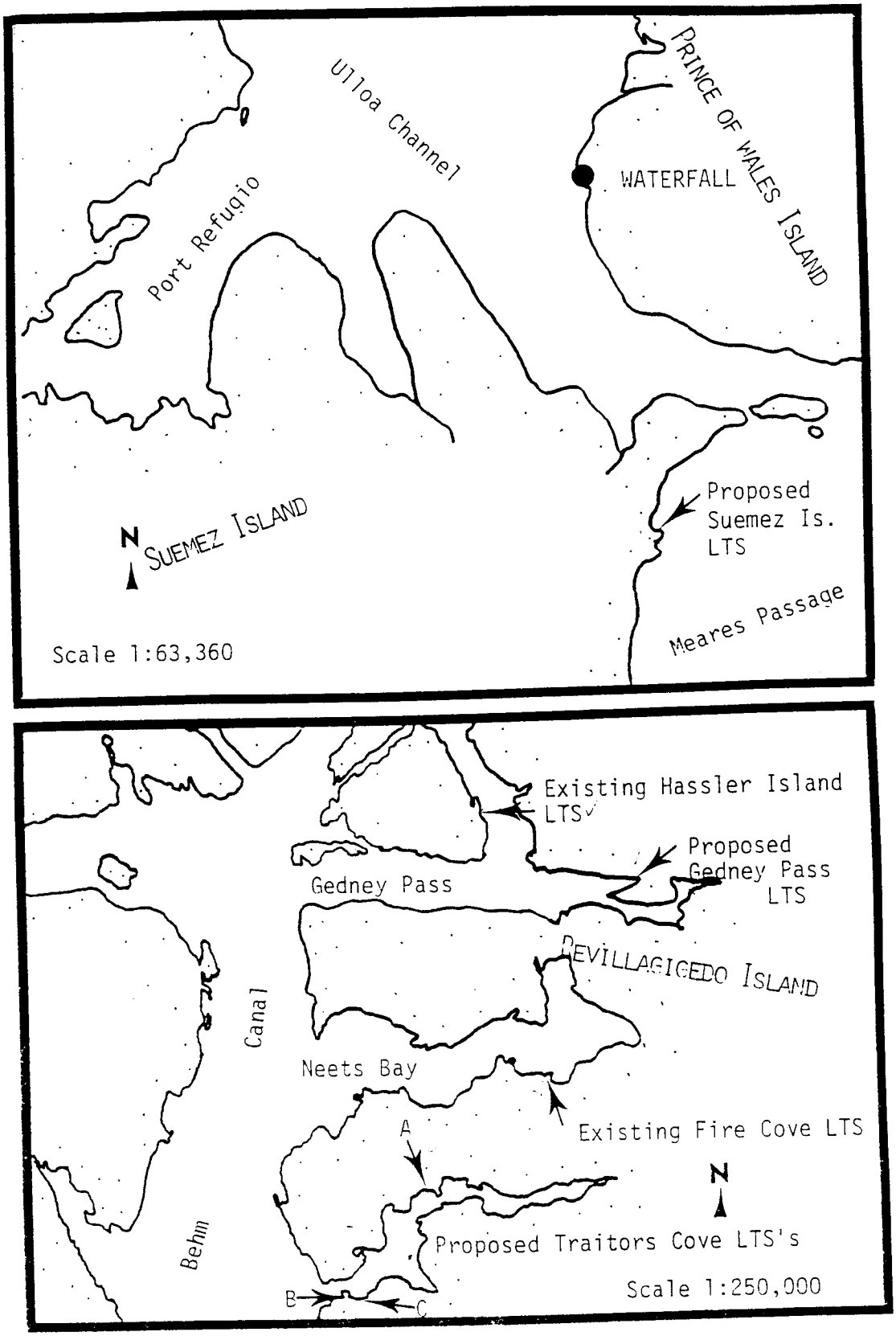

Figure 1. Existing and proposed log transfer sites investigated on Suemez, Revillagigedo, and Hassler Islands.

Table I. Transfer Sites Proposed for 1979-84 Operating Period

Transfer Sites	Volume (MBF)	Miles Road	Status
Suemez Island*	---	---	New
Margarita Bay†	13,350	7.2	Old Existing
Traitors Cove(A)	10,746	3.4	New
Traitors Cove(B)	10,251	10.1	New
Traitors Cove(C)	Possible alternative to Traitors Cove(B)		
Fire Cove	44,480	---	Existing
Shrimp Bay	13,366	5.3	Old Existing
Klu Bay△	25,987	9.8	New
Gedney Pass	Alternative to Klu Bay		
Hassler Island	12,179	4.5	Old Existing (Dismantled)
Bushy Point△	14,189	5.3	New

* Being considered by Dall Island-Suemez Island Planning Team

† R.D. Schultz and R.J. Berg. 1976. Some Effects of Log Dumping on Estuaries. Dept. of Commerce, NOAA, NMFS, Juneau. Proc. Rpt. 64p.

△ Dept. of Commerce, NOAA, NMFS. 1977. Neets Bay, Klu Bay, Revillagigedo Island, Proposed Log Transfer Sites. Juneau. June 28. 6p.

transect line marked in 1-meter (m) intervals, was attached near the high water line and extended seaward at a right angle to shore at each study site. Observations of plant and animal life were made at 5m intervals along the transect line. Other animals were observed while swimming through the area. Slope was measured with a protractor and leveling device at 5m intervals. Substrate composition and depth were noted and recorded. All observations were recorded on underwater paper.

The Suemez Island site was reached by aircraft. All other sites were reached by the Forest Service M/V TONGASS RANGER.

RESULTS

Following is a description of each site. Profiles of the bottom are illustrated in Figures 2-8. Animals and plants associated with each site are listed in the Appendix.

Suemez Island - Start of dive, 1312 hours; end of dive, 1350 hours; October 31, 1977.

The subtidal bottom drops gently along slopes of 5 to 12 degrees to a distance of 50 m from shore and then drops more moderately along slopes of 15 to 25 degrees to the end of the 85 m transect. The intertidal area is steep and composed of solid rock. Subtidal substrate is composed of large boulders to a distance of 25 m from shore. It then changes aruptly to sand and gravel for 35 m and then changes to wood debris to the end of the transect and beyond. No distinctive bands of macrophytic algae occur at this site. Biological production is quite rich on the bedrock substrate to a distance of 25 m from shore, but becomes poor further out.

An ocean swell from the northeast was running during the survey, causing scalloping of the gravel and sand substrate a few meters west of the transect. Water movement caused by the swell occurred to a depth of 17 m.

Traitors Cove (A) - Start of dive, 1650 hours; end of dive, 1715 hours; November 1, 1977.

The bottom drops moderately along slopes of 11 to 17 degrees to a distance of 10 m from shore and then drops with varying steepness along slopes of 8 to 22 degrees to the end of the 45 m transect. The intertidal zone is narrow and steep and is composed of bedrock. Subtidal substrate is composed of bedrock to a distance of 20 m from shore, grades into bedrock and sand for 10 m, and then boulders, cobbles, and

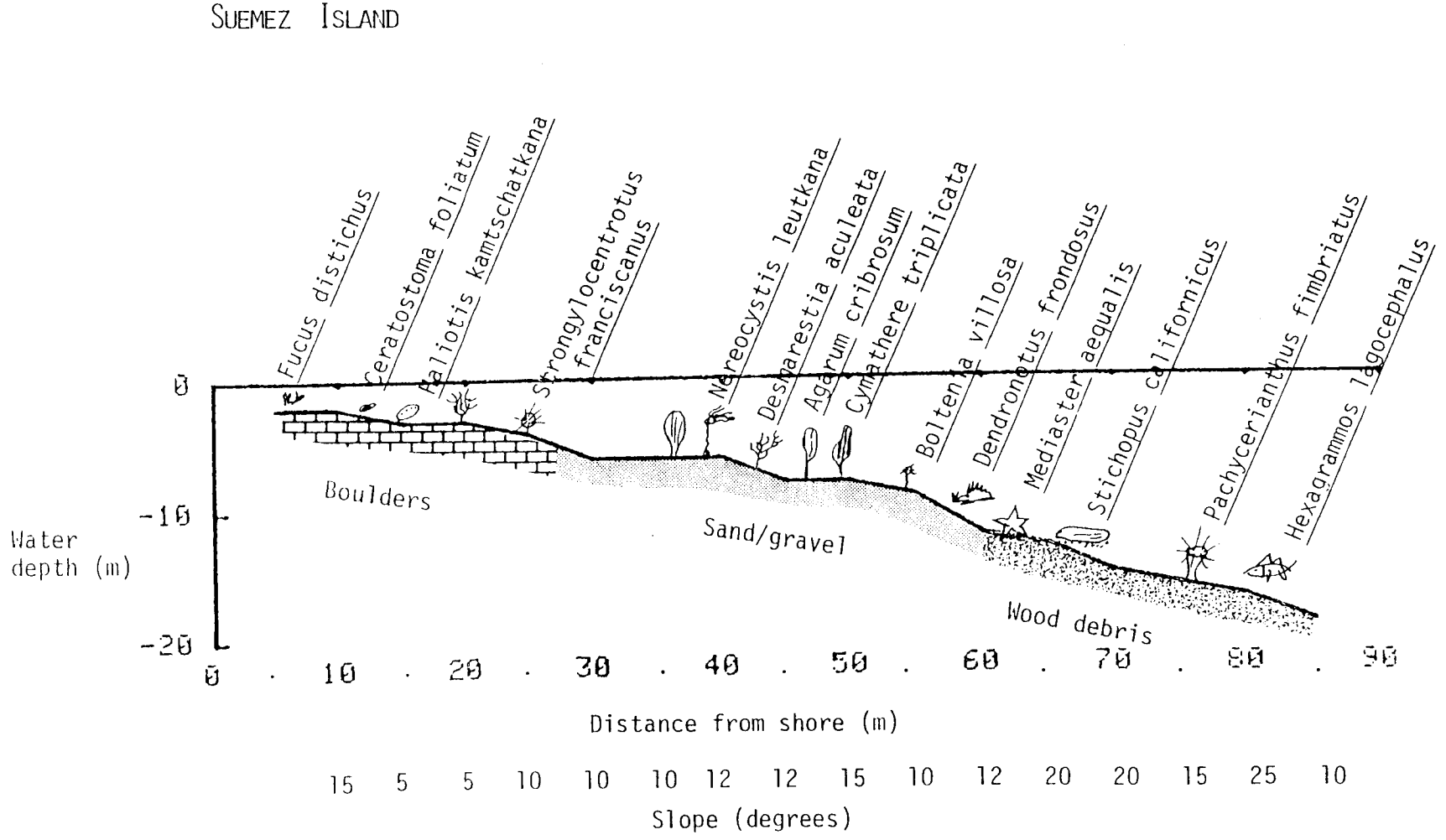

Figure 2. Life zone profile at proposed log transfer site on Suemez Island.

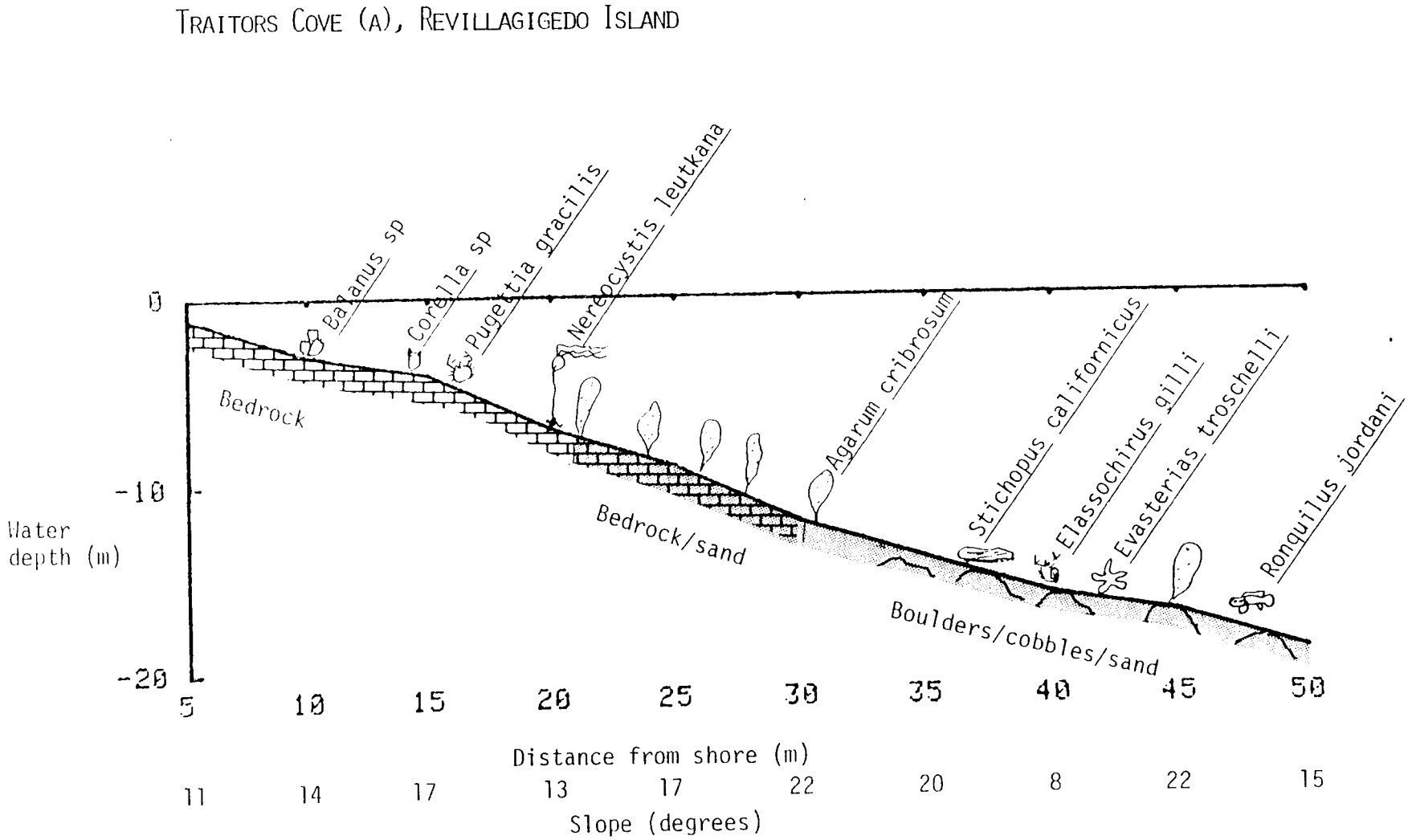

Figure 3. Life zone profile at proposed log transfer site in Traitors Cove.

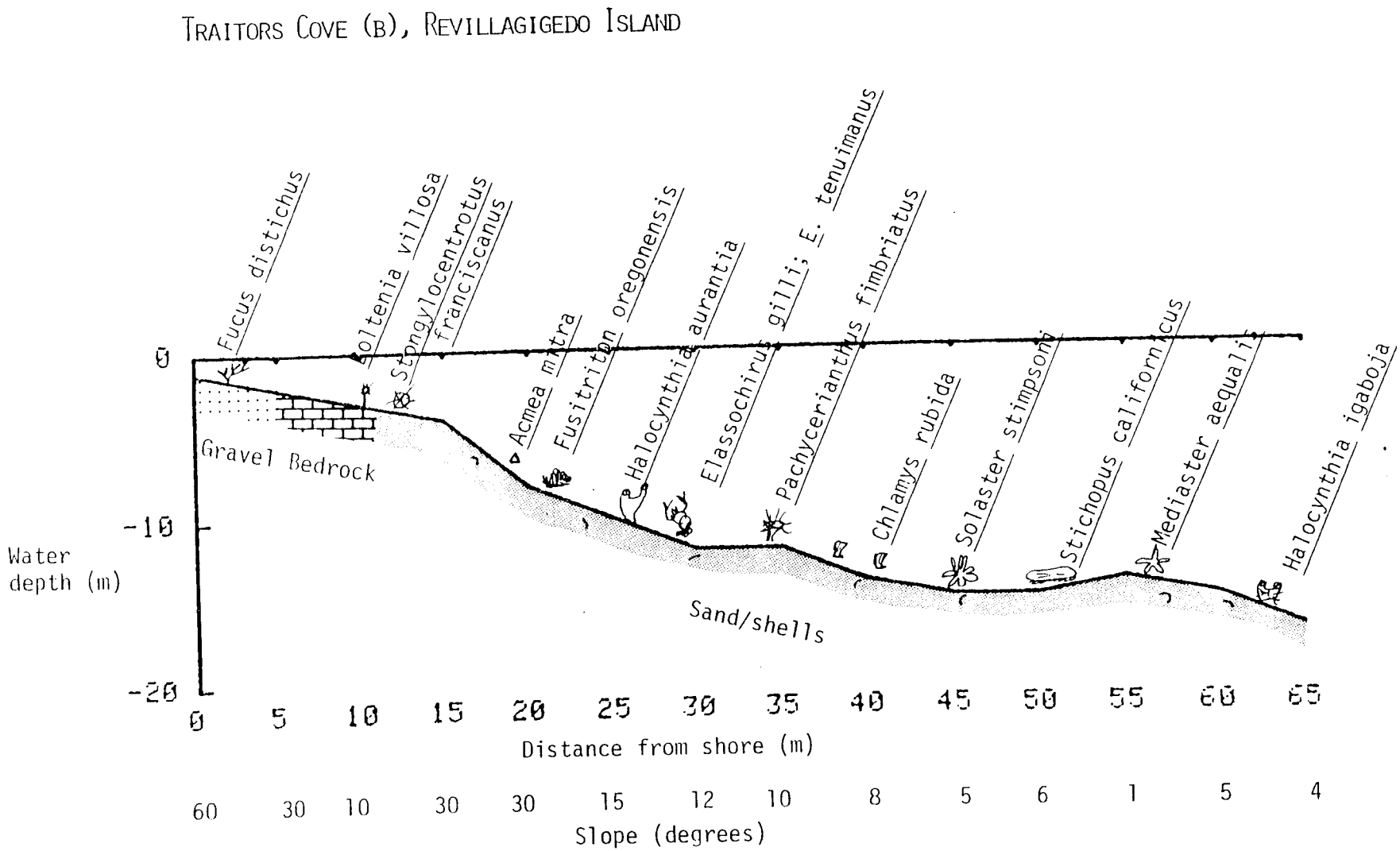

Figure 4. Life zone profile at proposed log transfer site in Traitors cove.

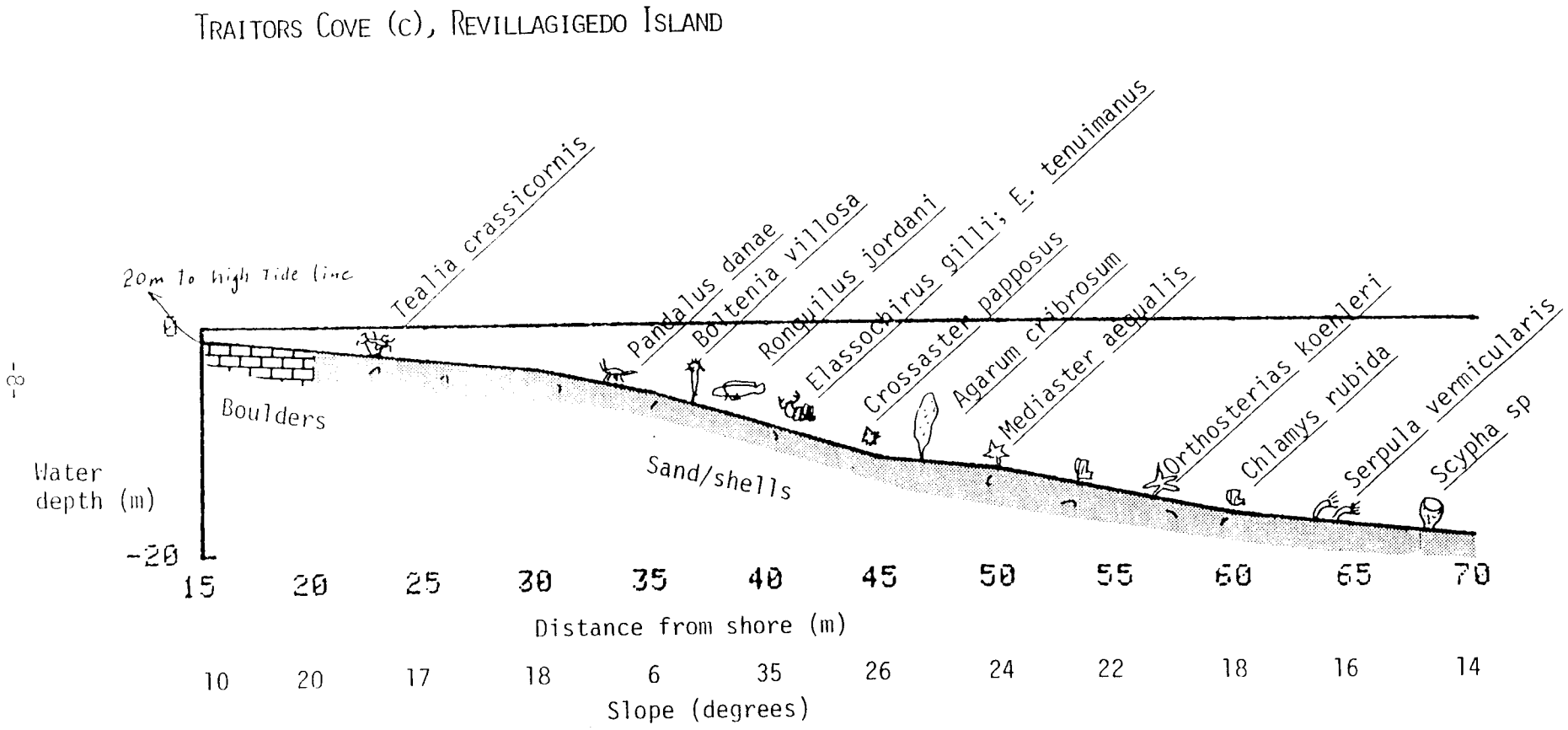

Figure 5. Life zone profile at proposed log transfer site in Traitors Cove.

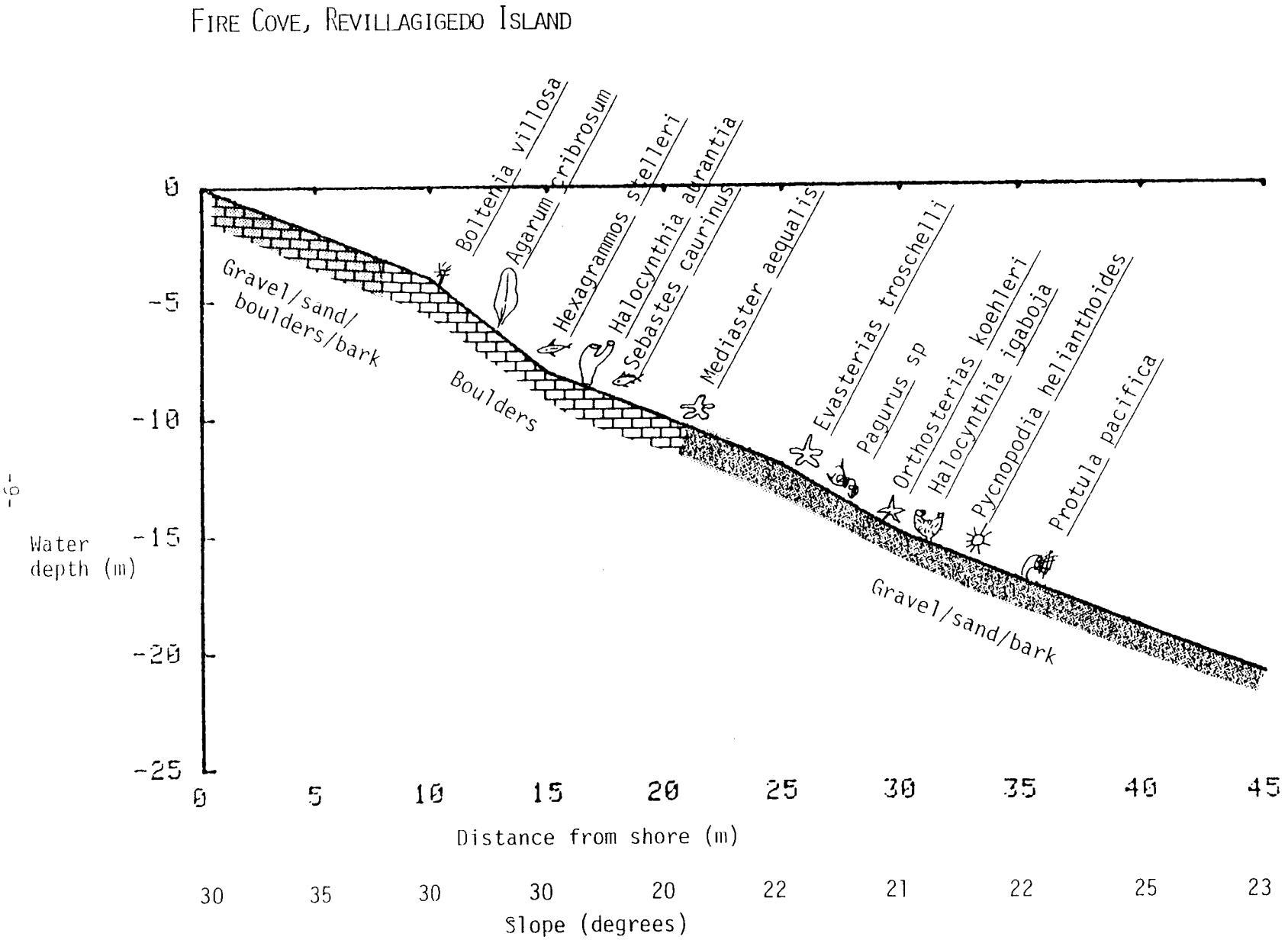

Figure 6. Life zone profile at existing log transfer site in Neets Bay.

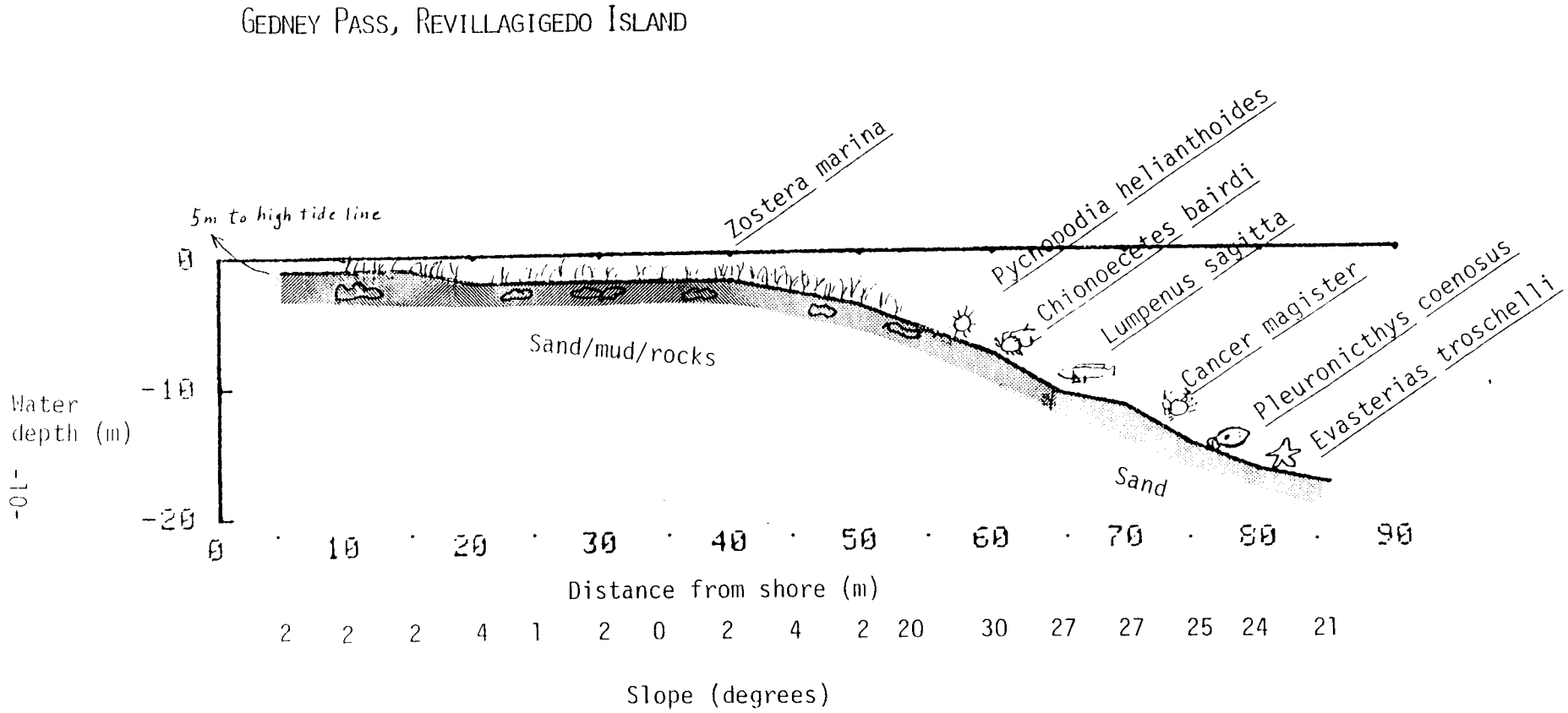

Figure 7. Life zone profile at proposed log transfer site in Gedney Pass.

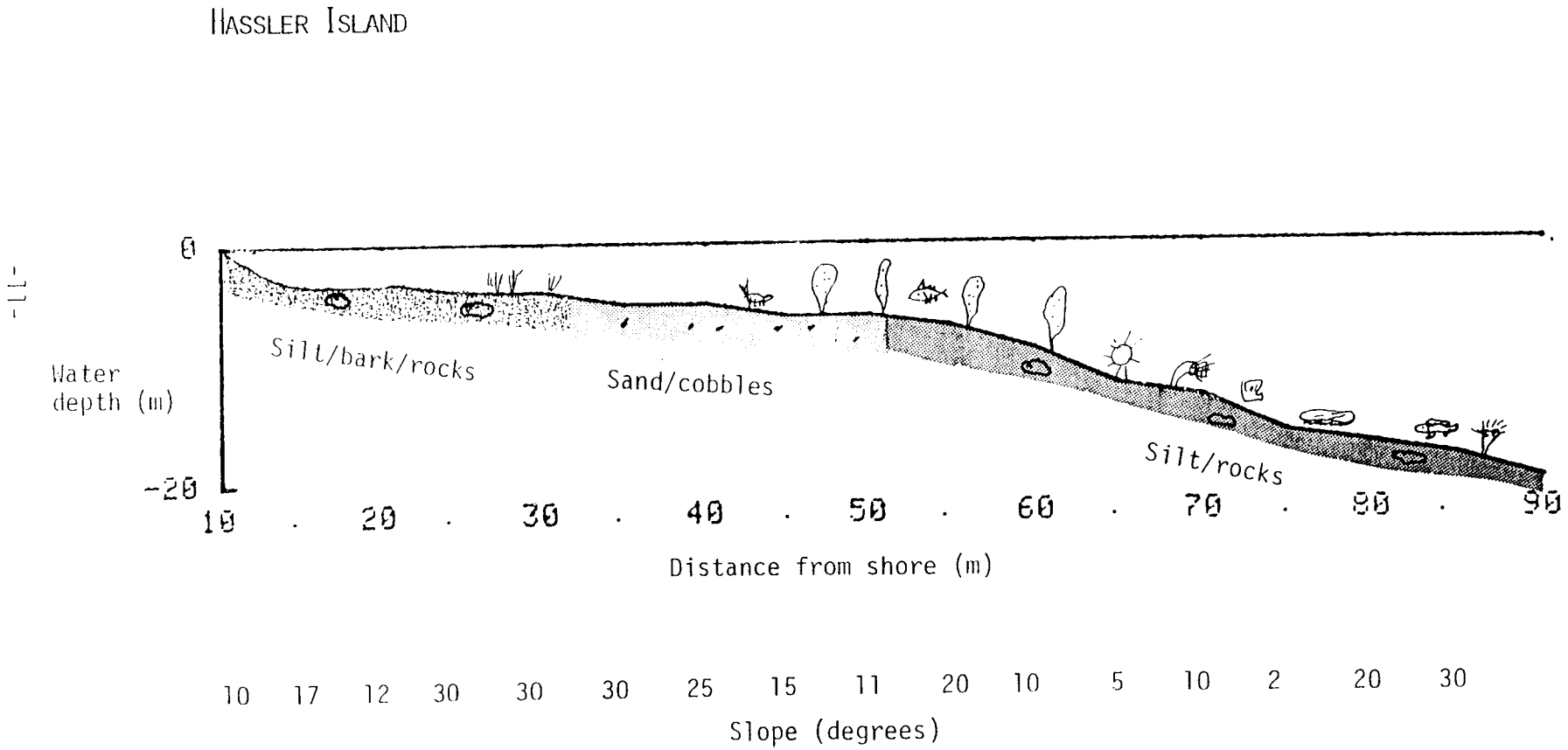

Figure 8. Life zone profile at existing log transfer site on Hassler Island.

sand to the end of the transect and beyond. A dense 10-m wide band of macrophytic algae (Agarum cribrosum) occurs 25 m from shore. Numerous invertebrates and schools of fish, apparently Shiner perch, (Cymatogaster aggregata), were observed.

Traitors Cove (B) - Start of dive, 0910 hours; end of dive, 0942 hours. November 2, 1977.

The bottom drops gently along slopes of 1 to 8 degrees to a distance of 25 m from shore and then drops more steeply along slopes of 10 to 60 degrees to the end of the 65 m transect and beyond. A somewhat concave spot in this area occurs about 45 m from shore, rising about 1 m and then plunges into deeper water. The intertidal zone is narrow and steep and is composed of bedrock. Subtidal substrate is gravel to a distance of 5 m from shore, changing to bedrock for 5 m, then grades into sand and shells to the end of the transect and beyond except at distances of 45 and 55 m from shore where bedrock is exposed.

Except for some encrusting algae (Lithothamnion sp) and popweed (Fucus distichus), there is no vegetation at this site. Various invertebrates and some fish were observed.

Traitors Cove (C) - Start of dive, 1012 hours, end of dive, 1037 hours; November 2, 1977.

The bottom drops fairly uniformly along slopes of about 10 to 25 degrees to the end of the transect, except about 25 meters from shore where the bottom drops steeply over bedrock at a slope of 35 degrees. The intertidal zone is steep and solid rock. Subtidal substrate is boulders and bedrock to a distance of 5 m from shore and then changes to sand and shells to the end of the 70 m transect and beyond. An occasional brown alga (Agarum cribrosum and Laminaria sp) occurs about 35 m from shore, but no distinct algal beds were observed. Some eelgrass (Zostera marina) occurs about 20 m from shore but is not very significant in terms of biomass. Various invertebrates and fishes were noted.

Fire Cove - Start of dive, 1300; end of dive 1330; November 2, 1977.

There is an A-frame lift-off type of log transfer facility that is currently in operation at this site (Re: CF permit, Neets Bay 8, dated September 22, 1975). The bottom drops steeply along slopes of 20 to 35 degrees throughout. At the base of the log crib, the substrate is composed of gravel, sand, some boulders, and bark debris for a distance of 15 m

from shore. Substrate is mostly boulders for another 25 m, and then changes abruptly to sand and bark debris to the end of the 45 m transect and beyond. An occasional specimen of brown alga (Agarum cribrosum) occurs in the area. Various species of invertebrates and several species of fish were noted here.

Gedney Pass - Start of dive, 0924 hours; end of dive, 0950 hours; November 3, 1977.

The bottom drops gently along slopes of 0 to 4 degrees to a distance of 45 m from shore and then drops more steeply along slopes of 19 to 30 degrees to the end of the transect and beyond. The intertidal zone is narrow, moderately steep, and is composed of solid rock. The subtidal substrate is sandy mud and loose rock to a distance of 60 m from shore and then grades to sand to the end of the 80 m transect and beyond. A 50-m wide dense band of eelgrass occurs here, starting about 10 m from shore. Numerous juvenile Dungeness crabs (Cancer magister), a few juvenile tanner crabs (Chionoecetes bairdi), and several juvenile flatfish were either in the eelgrass bed or on the eelgrass detritus in deeper water. Hence, this area is utilized by crab and flatfish as a rearing area. A few adult Dungeness crabs were observed here, too.

Hassler Island - Start of dive, 1050 hours; end of dive, 1121 hours; November 3, 1977.

This site has previously been used for a log transfer facility by Ketchikan Pulp Company (Re: CE Permit, Behm Canal 43, dated December 18, 1975). The facility incorporated the log skid system.

The bottom drops steeply along slopes of 20 to 30 degrees for the first 10 m, drops more gently along slopes of 2 to 10 degrees for 17 m and then drops along slopes of varying steepness, varying from 10 to 30 degrees.

Subtidal substrate is composed of silt, bark debris, and tree branches for 15 m, silt, rocks, bark debris for 5 m, silt-covered rocks for 5 m, sand and shells for 20 m, and then silt-covered rocks for 15 m. Substrate along the last 5 m of the 90 m transect and beyond is composed of sand and cobbles.

Macrophytic algae is limited to occasional Agarum cribrosum about 15 m from shore.

DISCUSSION AND RECOMMENDATIONS

Suemez Island - This site is suitable for a log transfer facility. Since biological productivity is rich only near shore, and is much reduced offshore, harmful impacts of bark accumulation area-wide will be relatively minimal. Effects of wave action may help to disperse bark into deeper water, especially as evidenced by the bark accumulation already present in deep water. Protection from wave action may be a problem here, however.

Traitors Cove (A) - This site is not ideal for use as a log transfer facility. The boulder and cobble bottom at this site would restrict bark dispersion. Also, the extent of algal production here is moderately rich. Alternative sites should be considered, or if alternatives are not practical, then some method of cleaning up bark debris from the subtidal zone should be implemented. Consultation with NMFS regarding possible cleanup methods is suggested.

Traitors Cove (B and C) - Either site is suitable for a log transfer facility. Adverse impacts of bark accumulation would be minimal at either site due to lack of any significant biological production.

Fire Cove - Steepness of slope at this existing log transfer facility is facilitating dispersal of bark into deeper, less productive waters. Continuance of log dumping here, instead of at a new site, is advised. Of course, if lengthy road construction would be required in order to dump logs at this site, then a new site may be preferable to impacting upland habitat through road construction.

Gedney Pass - This is not a suitable site for a log transfer facility. Extensive eelgrass beds and use as a rearing area by crabs and flatfishes establish this as a biologically sensitive site.

Hassler Island - This site has been impacted by previous log dumping operations. Continuance of this site for future log dumping is advised unless significant upland habitat would be impacted due to lengthy road construction. Then a new site may be preferable.

ACKNOWLEDGMENTS

Charles Judson, skipper of the M/V TONGASS RANGER, transported investigators and provided other field assistance. Bill Clark, NMFS, assisted in developing the life zone profiles.

SUMMARY

Environmentally, the following sites are suitable for log transfer facilities: Suemez Island, Traitors Cove, B and C, Fire Cove, and Hassler Island.

Traitors Cove (A) is suitable if bark cleanup methods are implemented.

Gedney Pass is not suitable for a log transfer facility.

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Appendix I. List of plant and animal species observed at proposed log transfer sites at Suemez, Revillagigedo, and Hassler Islands.

	Suemez Island	Traitors Cove A	Traitors Cove B	Traitors Cove C	Fire Cove	Gedney Pass	Hassler Island
VEGETATION							
Agarum cribrosum		x					
Laminaria sp	x	x		x			x
Constantinea rosa-marina							x
Lithothamnion sp		x	x				
Nereocystis leutkana	x	x					
Fucus distichus		x					
Bossiella sp	x						
Rhodymenia palmata							x
Desmarestia aculeata	x						
Cymathere triplicata	x						
Fauschea sp	x						
Zostera marina (eelgrass)						x	x
ANIMALS							
Porifera (sponges)							
Suberites sp (hermit crab sponge)				x			
Scypha sp		x					
Clione sp		x					
Cnidaria (anemones, jellyfish)							
Pachycerianthus fimbriatus (burrowing anemone)	x		x				x
Tealia crassicornis (anemone)				x			
Bryozoa (moss animals)		x					
Microporina borealis							x
Membranipora membranacea		x					
Echinodermata (starfish, sea urchins)							
Crossaster papossus (rose star)			x	x			
Mediaster aequalis (equal arm star)	x		x	x	x		x
Ophiopholus sp (brittle star)	x			x			
Pycnopodia helianthoides (sun star)	x		x	x	x	x	x
Orthosterias koehleri			x	x	x		
Henricia leviuscula (blood star)	x		x	x			
Evasterias troschelli (starfish)		x			x	x	x

	Suemez Island	Traitors A	Traitors B	Traitors C	Cove Fire Cove	Gedney Pass	Hassler Island
Dermasterias inbricata (leather star)		x			x		
Pisaster ochraceous (mottled star)					x		
Solaster stimpsoni (star starfish)			x				
S. dawsoni (starfish)	x		x				
Stichopus californicus (cucumber)	x	x	x	x			x
Cucumaria miniata (burrowing cucumber)	x		x	x			
Strongylocentrotus droebachiensis (green sea urchin)		x	x	x			
Mollusca (snails, nudibranchs)							
Cryptochiton stelleri (gumboot chiton)	x						
Amphissa sp (snail)				x			
Chlamys sp (scallop)		x	x	x	x		x
Pododesmus macroschisma (rock jingle)				x			
Snail (unid.)					x		
Haliotis kamtschatkana (abalone)	x						
Acmea sp (limpet)	x		x				
A. mitra	x		x				
Ceratostoma foliatum	x	x	x				
Fusitriton oregonensis (Oregon triton)			x				
Calliostoma caniculatum (top snail)		x					
Margarites pupillus		x					
Littorina sitkana						x	
Phidiana crassicornis (opalescent nudibranch)						x	
Coryphella fusca	x						
Dendronotus frondosus	x						
Annelida (segmented worms)							
Serpula vermicularis (tubeworm)	x	x	x	x	x	x	x
Protula pacifica			x		x		x
Spirobis sp	x	x					x
Arthropoda (crabs, shrimp)							
Pagurus sp (hermit crab)	x	x	x	x	x	x	x
Pandalus danae (dock shrimp)		x	x	x			x
Balanus sp (barnacle)		x	x				x
Elassochirus gilli (hermit crab)		x	x				x

	Suemez Island	Traitors A	Traitors B	Traitors C	Cove Fire	Gedney Pass	Hassler Island
E. tenuimanus (hermit crab)	x	x				x	
Hyas lyratus (lyre crab)						x	
Rhinolithodes papillosus			x				
Pugettia gracilis		x					
Cancer magister (Dungeness crab)						x	
Chionoecetes bairdi (Tanner crab)						x	
Shrimp (unid)						x	
Tunicata (sea squirts)							
Boltenia villosa	x	x	x		x		
Halocynthia aurantia			x		x		
H. igaboja			x		x		x
Ascidia paratropa			x				
Corella sp		x					
Colonial tunicate (unid)	x						
Fishes							
Sea perch (unid)		x			x		
Hexagrammos lagocephalus (rock greenling)	x						
H. stelleri (white spotted greenling)			x		x		
Sebastes caurinus (copper rockfish)							x
Lepidopsetta bilineata (rock sole)					x		
Ronquilus jordani (ronquil)		x		x			
Lumpenus sagitta (snake prickleback)						x	
Pleuronichthys coenosus (c-o sole)						x	
Bathymaster signatus (searcher)					x		
Myoxocephalus polyacanthocephalus (Great Sculpin)				x			